


Concept: Binomial Probabilities

Name:

COMPUTER COMPONENT

Instructions: In  follow the **Content Menu** path:

Probability > Binomial Probabilities



Work through all Sub Lessons of the following Lessons **in order**:

- *Binomial Probabilities ... What Are They*
- *Flipping a Coin ... Once*
- *Flipping a Coin ... Twice*
- *Flipping a Coin ... Three Times*
- *Summary*

Additional Required Materials: Pennies and Nickels



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

SUMMARY

1. Demonstrate your knowledge of Binomial Probabilities by filling in the spaces below.

Zero probabilities occur in any situation where there are **zero** possible

outcomes. **Tree** diagrams are a helpful tool for outlining all the outcomes for a particular situation.

2. *Flipping a Coin*

What is the probability?

$$P(\text{heads}) = \frac{1}{2} \qquad P(\text{tails}) = \frac{1}{2}$$

3. *Flipping a Coin Twice*

What is the probability?

$$P(2 \text{ heads}) = \frac{1}{4} \qquad P(1 \text{ head}) = \frac{2}{4} = \frac{1}{2} \qquad P(0 \text{ heads}) = \frac{1}{4}$$

4. *Flipping a Coin Three Times*

Recreate the tree diagram that shows all of the outcomes from flipping a coin three times. What is the probability of flipping 3 tails?

Flip	Heads	Heads	Heads	HHH
		Heads	Tails	HHT
		Tails	Heads	HTH
		Tails	Tails	HTT
	Tails	Heads	Heads	THH
		Heads	Tails	THT
		Tails	Heads	TTH
		Tails	Tails	TTT

The probability of flipping 3 tails is $\frac{1}{8}$.

OFF COMPUTER EXERCISES

1. Calculate the following probabilities from the experiment of flipping a coin three times:

(a) $P(0 \text{ heads}) = \frac{1}{8}$

(b) $P(1 \text{ head}) = \frac{3}{8}$

(c) $P(2 \text{ heads}) = \frac{3}{8}$

(d) $P(3 \text{ heads}) = \frac{1}{8}$

2. Now we'll look at all of the numerators in the probabilities that we have studied today.

numerators from 1 toss	1	1		
numerators from 2 tosses	1	2	1	
numerators from 3 tosses	1	3	3	1

Can you predict the numerators that will occur in the row for 4 tosses?

1 4 6 4 1

3. For this experiment you will be tossing a penny and a nickel, once.
 Use a tree diagram to list all possible outcomes for this experiment.

(P) Penny & (N) Nickel Toss	(P) H (N) T
	(P) H (N) H
	(P) T (N) T
	(P) T (N) H

- (a) What is the probability that the penny lands heads?

The probability that the penny lands on heads is $\frac{1}{2}$.

- (b) What is the probability that both coins land heads?

The probability that both coins land on heads is $\frac{1}{4}$

- (c) What is the probability that the coins do not match when tossed?

The probability that the coins don't match when tossed is $\frac{2}{4}$ or $\frac{1}{2}$.

4. What is the probability of flipping a coin two times and getting no heads?
 Show your thinking below.

Flip	Heads	Heads
		Tails
	Tails	Heads
		Tails

The probability of flipping a coin two times and getting no heads is $\frac{1}{4}$ as indicated in my tree diagram. 1 out of 4 results indicates/demonstrates the probability of getting no heads.